



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

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FERNALD

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REPLY TO THE ATTENTION OF: SRF-5J

LIBRARY:

Mr. Johnny W. Reising  
United States Department of Energy  
Fernald Area Office  
P.O. Box 398705  
Cincinnati, Ohio 45239-8705

Subject: Conditional Approval of the HPGE Core Counter Calibration Report

Dear Mr. Reising:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the above-referenced document as part of its oversight activities at the Fernald Environmental Management Project (FEMP). The document, which is dated September 2000, was prepared by Fluor Fernald for the U.S. Department of Energy. The document presents calibration and bench-scale test results for field use of the real-time high-purity germanium (HPGE) core counter.

U.S. EPA found the document to be adequate with one exception. The text on Page 3-2 states that variations in soil density over the range of 1.1 to 1.68 grams per cubic centimeter ( $\text{g/cm}^3$ ) would have a negligible effect on high-energy gamma emissions of uranium. This statement is true if it refers to absorption of the radiation by the soil itself. However, if a soil sample with a density of  $1.68 \text{ g/cm}^3$  has the same uranium concentration as another sample with a density of  $1.1 \text{ g/cm}^3$ , the denser sample will emit more than 1.5 times the high-energy gamma flux emitted by the less dense sample. Because the core counter analysis is based on count rates for a fixed sample volume, these two samples would appear to have different concentrations. The text seems to confuse an extensive quantity (mass) of uranium in soil with an intensive quantity (concentration) of uranium. The text should be revised to explain how soil density variations will be accounted for during use of the HPGE core counter.

U.S. EPA found the document to be adequate with this one exception. Therefore, U.S. EPA conditionally approves the document pending a text revision that addresses the one comment. Please contact me at (312) 886-4591 if you have any questions.

Sincerely,

Gene Jablonowski  
Remedial Project Manager  
Federal Facilities Section  
Superfund Remedial Response Branch #2

cc: Tom Schneider, OEPA-SWDO  
Kim Chaney, U.S. DOE-HDO  
John Bradburne, Fluor Fernald  
Terry Hagen, Fluor Fernald  
Tim Poff, Fluor Fernald

1